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COLLEGE OF AGRICULTURE
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SEASONAL LABOR REQUIREMENTS FOR CALIFORNIA CROPS

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R. L. ADAMS[3]

INTRODUCTION

CALIFORNIA AGRICULTURE, as now organized and constituted, requires the services of large numbers of farm workers during relatively short, intermittent periods throughout the year. This situation is attributable in part to the relatively high degree of specialization in production on most farms and in most areas but more particularly to the large number and extensive acreages of staple and specialty crops, each possessing relatively high man-labor requirements, which constitute so large a part of the agricultural production of the state.

Much of the labor used in producing these crops is highly seasonal, coming at more or less fixed times and extending over relatively short periods in any one area. Differences in climatic and other conditioning factors, however, provide for a succession of planting and harvesting dates in different parts of the state. This in turn provides for employment opportunities successively occurring in widely separated geographic areas.

As a result of these conditions, there developed, early in the history of California farming, relatively large numbers of migratory workers who move from area to area where employment is available or where they expect or hope that work can be found. These people, for the most part, constitute a homeless and landless group, forced by circumstances to move with the seasons from one locality to another in search of employment; earning possibly fair to good wages while work is available but, with the exception of the more able or more fortunate, unable to obtain sufficient employment over the course of the year to support themselves and families adequately.

Thus, on the one hand, there is evidenced among large numbers in this unstabilized labor group, low incomes per family, instability in employment and residence, bad housing and living conditions, unsatisfactory school and recreational facilities for the children, and other requisites of a satisfactory family life, all of which contribute to social conditions and attitudes that are both unwholesome for the group immediately concerned and to the stability and quality of the social life of communities

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[2] Paper No. 74, the Giannini Foundation of Agricultural Economics.

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affected. On the other hand, farmers are faced with labor supplies uncertain both in numbers and in competency of workers, at critical periods in the production and harvesting of crops; with partial or total loss of incomes and of capital equipment during recurrent periods of unrest among workers with their usual accompaniment of strikes and sabotage; and with employer-employee relations involving establishment of wage scales, working hours, housing, and other working conditions.

During recent years the acute economic distress of large numbers of rural workers, resulting largely from conditions beyond the control of either farm operators or laborers, has served to focus attention upon the social disadvantage and plight of this part of the populace. Public agencies engaged in the administration of unemployment relief, in rehabilitation, and in other social functions of government are faced with a multiplicity of problems of far-reaching magnitude concerning which there is but little information of a definite nature at hand. To meet this situation, a comprehensive program of investigation into the conditions of farm labor in California has been outlined by the University of California College of Agriculture for prosecution as time and facilities permit. One aspect of the situation which was given immediate attention relates to the amounts, kinds, and time when seasonal labor is required in the production of California field, fruit, and truck crops under present-day conditions. This investigation, in effect an inventory of the demand aspect of seasonal labor, is reported here in summary form.

Object and Method of Present Study.—During 1936 and early in 1937, data on seasonal labor for producing, harvesting, and preparing California crops for market were collected from all the counties requiring such labor. Original reports were issued as mimeographed separates by counties as rapidly as prepared.[4] This bulletin is a summary of the county findings for the state as a whole. The data relate to the 1935–36 crop year, unless otherwise specifically noted, and deal only with the labor requirements for crop production, those for livestock not being included. The findings, furthermore, apply only to hired seasonal workers as distinguished from labor employed on a more or less permanent basis or supplied by farm operators or the members of their families. They do not apply to teamsters, tractor drivers, or shed workers. Thus the data include the migratory, transient, or roving workers, and the local residents as well, who are drawn upon to help out as occasion requires.

[4] Data were collected from all California counties except Del Norte, Humboldt, Inyo, Mono, and Trinity. Of the various counties for which data were collected, mimeographed or typed reports were prepared for distribution to interested agencies. The supply of these reports is now exhausted but copies may be consulted at offices of county farm advisors.

The procedure employed consisted in: (1) delimiting areas in the state within which methods and practices used and seasonality of production are generally similar; (2) determining the acreage and volume of production of each type of crop within each area; (3) determining the tasks for which seasonal workers are employed, the total labor requirement for the performance of such tasks, and the time of need of such labor for each crop and task; and (4) from these data, the monthly and annual requirements for seasonal workers by crops and tasks in each county were computed and reported in terms of man-days of labor required.

The object of this investigation was to determine the current requirements for extra help in producing California crops and to provide basic information upon which estimates might be made of the requirements for such labor in other years or as occasion demanded.

This publication presents a compilation of the several county studies to show the total state needs for seasonal crop laborers throughout the year.

CROPS, ACREAGE, AND PRODUCTION

The crops, acreage, and volume of production involved in determining the requirements for seasonal farm workers in California are listed in table 1. The figures in table 1 represent the total acreage and actual or estimated volume of production. Seasonal workers were not used in the production or harvesting of all crops in all counties. Hence these figures exceed, in some cases, the acreage and yield of product reported in later sections as using or requiring the use of seasonal labor.

OUTPUT PER MAN-DAY FOR SELECTED TASKS

The range and usual amount of work accomplished in a 9-hour day[5] by adult male workers in performing selected hand tasks are reported in table 2 for use in determining seasonal labor requirements. The usual rate of output for each task represents a general cross-section figure for the state. It varies with locality and with different farms in the same locality, with differences in soil conditions, in prevalence of weeds, with types or varieties of crops, with heights of trees and spacing of annual plants, with the volume of product per acre, and with types and efficiencies of workers. The range in rates of output is reported only for those tasks in which marked variation in work accomplishment was reported.

The amount of work performed per man is subject to considerable variation. This is the result not only of varying work capacities of different individuals but also to variation in working conditions. Comfortable

[5] The average amount of work accomplished by an experienced efficient adult male worker during a 9-hour workday, under the usual working conditions for each task in each area is known as a "man-day" of work.

TABLE 1

ACREAGE AND PRODUCTION OF FIELD, FRUIT AND NUT, AND TRUCK CROPS USED IN DETERMINING SEASONAL LABOR REQUIREMENTS IN CALIFORNIA, 1935–36

Crop	Acreage	Production
Field crops:		
Alfalfa hay	621,591	2,729,429 tons
Alfalfa seed	*	509,000 pounds
Barley	1,104,827	25,980,007 bushels
Beans, dry	370,192	3,878,476 cwt.
Corn, grain	35,754	968,886 cwt.
Cotton	216,212	236,855 bales
Flax	32,264	136,772 bushels
Grains, mixed	2,927	54,921 bushels
Hay, other than alfalfa	1,011,881	1,272,902 tons
Hops	7,956	105,563 cwt.
Oats	115,587	3,233,166 bushels
Onions	9,298	1,538,881 cwt.
Peppers and pimientos (canning)	1,630	5,170 tons
Peppers, bell	1,500	10,800 cwt.
Peppers, chili (dried)	2,250	2,902,000 pounds
Potatoes, Irish	42,581	6,790,130 cwt.
Rice	91,798	3,192,262 cwt.
Rye	9,747	119,530 bushels
Silage	11,927	104,664 tons
Sorghums for grain	121,305	2,621,381 cwt.
Sugar beets	116,978	1,580,527 tons
Sunflowers	3,935	38,789 cwt.
Wheat	614,836	9,825,332 bushels
Fruit and nut crops:		
Almonds	72,334	13,362 tons
Apples	37,840	8,581,506 boxes†
Apricots	75,411	216,005 tons
Avocados	8,215	9,218 tons
Bush fruits	2,700	1,000,776 crates
Cherries	13,914	335,211 cwt.
Dates	3,152	65,074 cwt.
Figs (dry weight)	38,165	627,791 cwt.
Grapefruit	16,053	2,730,077 boxes‡
Grapes	497,687	43,916,606 cwt.
Lemons	45,009	14,342,041 boxes§
Olives	24,319	29,813 tons
Oranges	236,378	69,944,726 boxes†
Fruit and nut crops (*continued*):		
Passion fruit	85	15,300 cwt.
Peaches and nectarines	101,910	566,525 tons
Pears	61,762	202,090 tons
Persimmons	1,358	50,338 cwt.
Plums	29,758	4,087,157 crates¶
Pomegranates	438	48,119 lugs‖
Prunes (dry weight)	162,084	233,400 tons
Tangerines	566	69,527 lugs**
Walnuts	117,336	52,211 tons
Truck crops:		
Anise	150	60,000 crates
Asparagus	77,350	1,701,700 cwt.
Beans, green	8,565	1,251,512 hampers
Brussels sprouts	2,683	177,554 cwt.
Cabbage and broccoli	5,083	1,107,282 crates††
Carrots	20,126	4,964,216 crates
Cauliflower	13,817	3,046,633 crates
Celery	13,047	3,421,489 crates
Corn, green	11,330	2,924,147 lugs
Cucumbers	2,776	249,206 cwt.
Endive	1,011	176,610 crates
Garlic	2,390	14,487,500 pounds
Lettuce	90,431	12,670,652 crates
Melons, including watermelons	58,986	343,261 tons
Peas	75,286	6,162,529 hampers
Potatoes, sweet	10,425	705,754 cwt.
Rhubarb	2,249	260,171 cwt.
Spinach	15,340	63,304 tons
Squash	4,748	424,629 cwt.
Strawberries	3,695	847,240 crates‡‡
Tomatoes	83,248	8,842,841 cwt.
Seed crops:		
Onion seed	40	8,640 pounds
Seed peas	4,542	63,500 cwt.
Sugar-beet seed	410	650 tons
Tomato seed	330	35,000 pounds

* Included in alfalfa-hay acreage. ‡ Boxes of 40 pounds. ¶ Crates of 22 pounds. **Lugs of 24 pounds. ‡‡ Crates of 24 quarts.
† Boxes of 45 pounds. § Boxes of 50 pounds. ‖ Lugs of 35 pounds. †† Crates of 88 pounds.

Source of data: Compiled from field collection of data. The data for important agricultural areas were published in mimeograph form for individual counties.

TABLE 2

RANGE AND USUAL OUTPUT PER MAN-DAY FOR SPECIFIED CROPS AND TASKS, 1935–36

Crop	Task	Output per man-day (9 hours)	
		Range in rates	Usual rate
Almonds	Pruning	0.25-2.25 acres	1.0 acre
	Brush disposal	.....	4.5 acres
	Knocking	.....	0.5 acre
	Hulling (hand)	.....	275 pounds
Apples	Pruning	.....	0.25 acre
	Brush disposal	.....	2.5 acres
	Thinning	0.17-0.33 acre	0.25 acre
	Picking (for shipping)	.....	1.0 ton
	Picking (for drying)	.....	1.25 tons
	Sorting and wiping	.....	1.0 ton
	Packing	.....	75 boxes
Apricots	Pruning	0.17-0.6 acre	0.2 acre
	Brush disposal	2.0-4.0 acres	2.5 acres
	Thinning	.....	0.25 acre
	Picking (for shipping)	.....	1,200 pounds
	Picking (for drying)	1,000-2,000 pounds	1,500 pounds
	Cutting	500-750 pounds	750 pounds
Asparagus	Cutting, hauling, trimming, sorting, and packing	.....	4 crates
Beans	Hoeing and weeding	1.0-5.0 acres	2.5 acres
	Piling vines	0.7-3.0 acres	2.0 acres
Bush fruits	Picking (blackberres)	.....	300 pounds
	Picking (raspberries)	.....	150 pounds
	Picking (youngberries)	.....	300 pounds
Cabbage	Planting (hand)	.....	0.33 acre
	Hoeing	.....	0.75 acre
	Dusting	.....	1.5 acres
	Cutting	.....	90 crates
	Packing	.....	45 crates
Carrots	Weeding	.....	0.33 acre
	Hoeing	.....	1.0 acre
	Pulling and bunching	.....	13.5 crates*
Cauliflower	Hand planting	.....	0.5 acre
	Hoeing	.....	1.25 acres
	Cutting	.....	72 crates
	Packing	.....	45 crates
Celery	Transplanting to field	.....	0.25 acre
	Weeding	.....	0.5 acre
	Harvesting	.....	25 crates
Cherries	Pruning	.....	0.75 acre
	Picking (shipping)	.....	150 pounds
	Picking (canning)	.....	200 pounds
	Sorting and loose packing	.....	900 pounds
	Tight packing	.....	225 pounds

* Crates of 6 dozen bunches.

(Continued on next page)

TABLE 2—(*Continued*)

RANGE AND USUAL OUTPUT PER MAN-DAY FOR SPECIFIED CROPS AND TASKS, 1935–36

Crop	Task	Output per man-day (9 hours)	
		Range in rates	Usual rate
Corn (grain)	Picking, husking, hauling, and cribbing	.....	0.75 acre
Corn (sweet)	Hoeing and suckering	.....	1.0 acre
	Picking and packing	.....	70 lugs†
Cotton	Chopping	.....	2.5 acres
	Picking	.....	200 pounds
Cucumbers	Hoeing and thinning	.....	0.5 acre
	Hoeing (second time)	.....	3.0 acres
	Picking	.....	800 pounds
Currants	Pruning	.....	0.25 acre
	Hoeing	.....	0.33 acre
	Picking	.....	9 crates‡
Dates	Picking	.....	250 pounds
Figs	Pruning (Kadotas)	.....	0.3 acre
	Pruning (others)	.....	0.5 acres
	Caprifying	.....	1.0 acre
	Picking (Kadotas)	.....	400 pounds
	Picking (others—shipping)	.....	300 pounds
	Picking up (for drying)	500-900 pounds	700 pounds
Grapefruit	Picking	.....	90 field boxes
Grapes (raisin)	Pruning (trellis system)	.....	0.5 acre
	Pruning (short system)	.....	0.66 acre
	Tying and wrapping	.....	1.5 acres
	Dusting	.....	20 acres
	Picking	.....	1.5 tons
	Turning trays	.....	1,500 trays§
	Rolling paper trays	.....	1,500 trays§
	Boxing and delivering	.....	2.5 tons
Grapes (table and wine)	Pruning	0.5-0.75 acre	0.75 acre
	Brush disposal	2.0-5.0 acres	2.0 acres
	Suckering	.....	1.5 acres
	Thinning and girdling	.....	0.37 acre
	Girdling only	.....	1.0 acre
	Dusting	.....	20.0 acres
	Hoeing	.....	2.0 acres
	Picking (table varieties)	.....	1,500 pounds
	Picking (wine varieties)	1,500-3,000 pounds	2,000 pounds
Hops	Pruning, stringing, and training	0.5-1.0 acre	0.5 acre
	Picking	200-250 pounds	250 pounds¶
Lemons	Picking	10-30 boxes	20.0 field boxes‖

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† Lugs of 3 dozen ears.
‡ Crates of 18 pounds net weight.
§ 22 pounds green weight; 5.5 pounds dried weight.
¶ Green weight.
‖ Rate varies markedly at different times of the year, namely from 10 to 30 boxes.

TABLE 2—(*Continued*)

RANGE AND USUAL OUTPUT PER MAN-DAY FOR SPECIFIED CROPS AND TASKS, 1935–36

Crop	Task	Output per man-day (9 hours)	
		Range in rates	Usual rate
Lettuce	Thinning	.....	0.5 acre
	Hoeing	.....	1.0 acre
	Cutting	.....	22.5 field crates
	Dry packing in field	.....	63 crates
Melons	Hoeing	.....	1.0 acre
	Thinning	.....	10 acres
	Turning vines	.....	2.0 acres
	Picking (cantaloupes)	.....	30 crates
	Picking (Honey Balls)	.....	30 crates
	Picking (Honeydews)	.....	100 crates
Olives	Pruning	.....	0.2 acre
	Picking (for oil)	300-500 pounds	400 pounds
	Picking (for pickling)	275-400 pounds	300 pounds
Onions	Transplanting to field	.....	0.2 acre
	Weeding	0.33-1.0 acre	1.0 acre
	Hand cultivating	.....	1.5 acres
	Hoeing (first time)	.....	0.5 acre
	Hoeing (second time)	.....	1.5 acres
	Pulling and windrowing	.....	1.0 acre
	Topping, sorting, and sacking	1,200-3,000 pounds	2,000 pounds
Oranges	Pruning	.....	0.25 acre
	Picking	.....	50 field boxes**
Peaches	Pruning	.....	0.25 acre
	Brush disposal	.....	2.5 acres
	Thinning	0.15-0.25 acre	0.2 acre
	Picking (freestones for shipping)	1,200-2,000 pounds	1,500 pounds
	Picking (freestones for drying)	1,500-3,000 pounds	2,000 pounds
	Picking (clingstones)	.....	2,000 pounds
	Cutting to dry (freestones)	1,000-2,000 pounds	1,500 pounds
	Cutting to dry (clingstones)	.....	1,000 pounds
Pears	Pruning	.....	0.25 acre
	Brush disposal	.....	3.0 acres
	Hoeing and suckering	.....	2.0 acres
	Picking	1,200-2,000 pounds	1,600 pounds
	Cutting for drying	1,000-1,350 pounds	1,000 pounds
Peas	Hoeing	.....	1.0 acre
	Picking (poled varieties)	.....	180 pounds
	Picking (bush varieties)	210-420 pounds	300 pounds
Peppers	Thinning and resetting	.....	2.0 acres
	Hoeing	.....	1.5 acres
	Picking (for drying)	.....	3,000 pounds¶
	Picking (for canning)	.....	2,000 pounds¶
Persimmons	Picking	.....	1,800 pounds

** Three field boxes equal 2 packed boxes.

¶ Green weight.

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TABLE 2—(*Concluded*)

RANGE AND USUAL OUTPUT PER MAN-DAY FOR SPECIFIED CROPS AND TASKS, 1935–36

Crop	Task	Output per man-day (9 hours)	
		Range in rates	Usual rate
Plums	Pruning	.....	0.25 acre
	Thinning	.....	0.2 acre
	Picking	.....	800 pounds
Potatoes	Cutting seed	750-2,000 pounds	2,000 pounds
	Hoeing	.....	1.5 acres
	Digging by hand, picking up, sorting, and sacking	.....	2,500 pounds
	Picking up after digging and sacking	2,600-7,000 pounds	6,000 pounds
Prunes	Pruning	0.25-0.5 acre	0.5 acre
	Brush disposal	.....	2.5 acres
	Picking up for drying	1,400-2,500 pounds	2,000 pounds
Rice	Shocking bundles	.....	3.0 acres
Sorghums	Hoeing	.....	2.5 acres
	Cutting heads by hand	0.75-1.0 acre	0.75 acre
Spinach	Hoeing and thinning	0.33-0.66 acre	0.66 acre
	Cutting for canning	1.5-4.0 tons	2.0 tons
Squash	Picking	.....	50 crates††
Strawberries	Hoeing	.....	0.05 acre
	Picking	.....	15 crates
Sugar beets	Thinning	0.4-0.75 acre	0.5 acre
	Hoeing (first time)	1.0-2.5 acres	1.5 acres
	Hoeing (second time)	.....	2.5 acres
	Pulling, topping, and loading	5.0-6.0 tons	5 tons
Sweet potatoes	Planting	.....	0.6 acre
	Hoeing	.....	1.5 acres
	Harvesting	.....	0.15 acre
	Picking up	.....	65 lugs
	Picking up and packing	.....	30 lugs
Tomatoes	Transplanting to field (hand)	0.66-1.0 acre	0.75 acre
	Hoeing	.....	1.0 acre
	Dusting	.....	5.0 acres
	Picking (for market)	.....	1,200 pounds
	Picking (for canning)	2,000-2,500 pounds	2,500 pounds
Walnuts	Thinning and hoeing	.....	0.5 acre
	Knocking and picking up	.....	200 pounds
	Picking up and hand hulling	.....	150 pounds
Watermelons	Pruning	.....	1.5 acres
	Hoeing (second time)	.....	3.0 acres
	Turning vines	.....	4.0 acres
	Picking	10.0-18.0 tons	15.0 tons
	Loading on trucks	.....	6.0 tons

†† Crates of 24 pounds.

Source of data:

Compiled from field collection of data. The data for important agricultural areas were published in mimeograph form for individual counties.

working conditions—freedom from excessive heat, dust, rains, weed growths, and other adverse conditions—will tend to increase output. Unfavorable working conditions can materially reduce daily outputs per worker. Under actual conditions the workers may fall short of meeting outputs of adult and efficient workers, especially if the task be one in which women and children are employed.

These data are assembled from the various county reports of seasonal

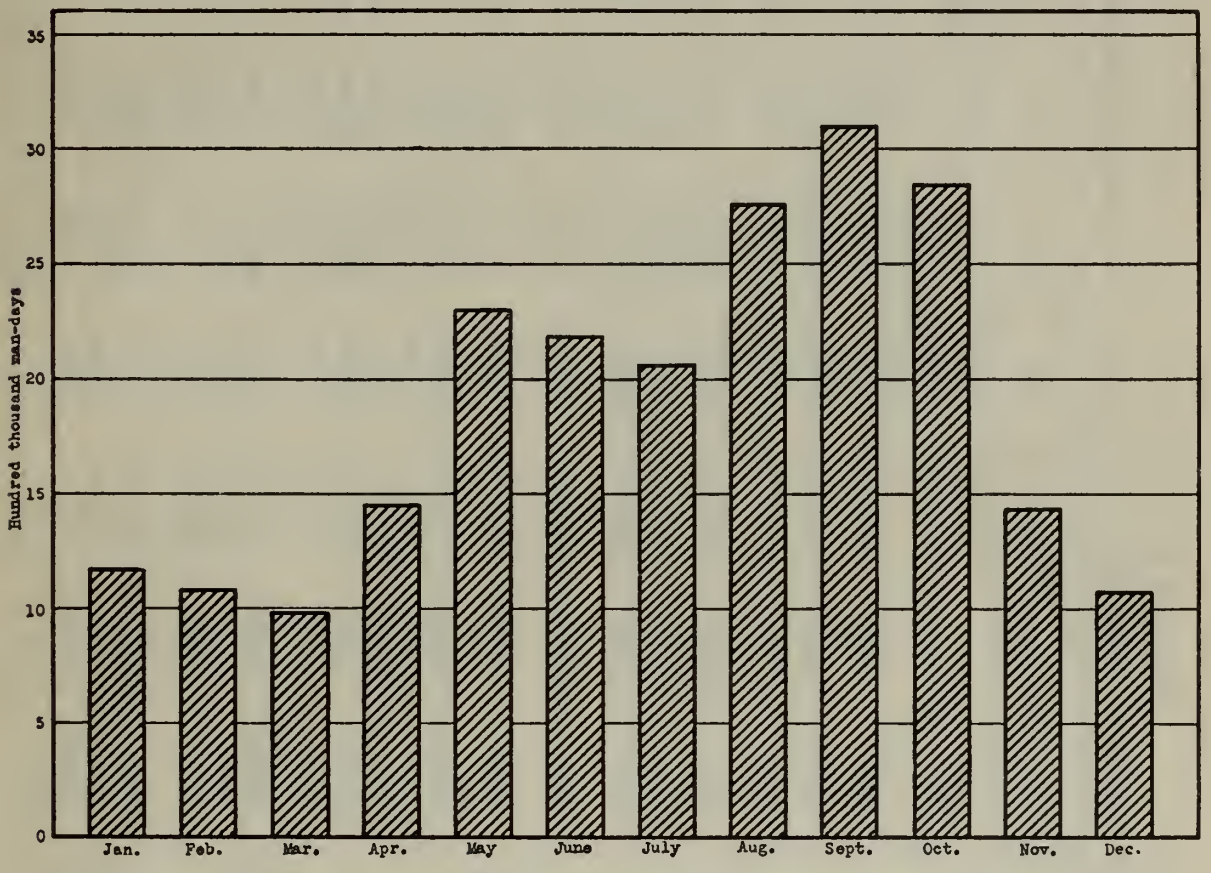

Fig. 1.—Total man-days of seasonal labor required each month in California. (Data from table 3.)

labor requirements issued previously as separates. All operations are not included. For other tasks and locality rates, reference may be made to the individual county reports.

TOTAL REQUIREMENTS FOR SEASONAL LABOR IN MAN-DAYS

The total annual requirements for seasonal labor for the planting, growing, and harvesting of the various field, fruit, truck, and miscellaneous crops of California, as shown by the various county studies, amounts to 22,467,800 man-days (table 3). This total is made up of varying requirements by months, ranging from a minimum of a little more than 1,000,000 man-days in December and February to a peak, or maximum, of over 3,000,000 man-days in September. Table 3 indicates the requirements by months.

TABLE 3

MONTHLY AND ANNUAL REQUIREMENTS FOR SEASONAL WORKERS IN MAN-DAYS BY COUNTIES AND FOR THE STATE, 1935–36

County	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total by counties
Alameda	6,323	3,031	21,071	52,546	49,063	25,997	47,089	27,091	23,969	25,936	13,686	12,470	308,272
Alpine	—*	—	—	—	—	180	390	180	—	—	—	—	750
Amador	—	—	—	—	—	—	—	75	2,330	156	—	—	2,561
Butte	8,904	8,973	4,020	4,151	19,397	5,028	11,238	44,749	68,735	72,483	22,863	8,983	279,524
Calaveras	—	—	—	—	—	208	—	420	1,300	1,364	200	—	3,492
Colusa	3,125	2,839	1,403	7,091	6,165	16,723	9,465	35,177	41,317	11,971	2,766	2,055	140,097
Contra Costa†	14,244	8,502	3,183	14,851	37,644	30,942	39,685	38,931	36,434	46,132	19,549	18,095	308,192
Del Norte	—	—	—	—	—	—	—	—	—	—	—	—	—
Delta lands‡	20,012	9,045	220,734	305,381	346,313	318,963	117,157	148,721	92,739	82,677	63,183	59,851	1,784,776
El Dorado	5,300	5,283	1,131	1,062	7,043	5,107	2,250	7,483	6,090	117	1,472	4,452	46,790
Fresno	163,266	156,921	47,862	69,374	149,350	142,856	123,220	286,340	479,356	309,648	124,700	98,765	2,151,658
Glenn	5,846	5,839	3,070	2,288	9,704	12,304	12,020	16,429	21,506	31,104	7,783	4,771	132,664
Humboldt	—	—	—	—	—	—	—	—	—	—	—	—	—
Imperial	59,901	89,786	93,719	97,439	109,445	106,399	46,676	7,530	10,989	68,484	71,930	71,406	833,704
Inyo	—	—	—	—	—	—	—	—	—	—	—	—	—
Kern	45,424	32,802	5,814	25,327	39,811	58,498	51,547	94,126	57,034	200,493	124,937	71,341	807,154
Kings	25,415	16,137	1,724	6,103	24,837	66,233	25,168	57,708	20,130	105,232	41,247	23,416	413,350
Lake	4,877	4,726	2,152	755	5,915	6,621	7,381	30,246	20,782	12,091	2,688	4,753	102,987
Lassen	—	—	—	—	—	11,571	19,285	7,789	380	303	—	—	39,328
Los Angeles	76,613	77,465	76,591	109,270	182,352	179,355	144,566	122,993	167,344	131,112	59,115	50,256	1,377,032
Madera	35,028	20,270	3,629	3,300	11,090	15,833	15,737	26,233	38,881	76,590	54,521	32,186	333,298
Marin	145	145	187	581	5,473	3,998	2,106	1,858	2,072	1,136	19	145	17,865
Mariposa	—	—	—	—	—	—	—	—	114	324	84	—	522
Mendocino	7,639	5,696	2,115	5,818	9,222	14,467	5,543	34,891	34,528	9,169	7,881	4,463	141,432
Merced	28,441	23,924	19,139	7,217	38,395	46,527	52,882	100,049	149,371	100,154	33,513	23,767	623,379
Modoc	—	—	—	—	80	9,700	34,601	29,386	936	1,985	90	—	76,778
Mono	—	—	—	—	—	—	—	—	—	—	—	—	—
Monterey	22,747	42,218	51,432	67,821	109,898	84,118	93,968	90,065	88,708	81,996	52,165	26,839	811,975
Napa	7,613	9,407	3,546	295	4,274	5,020	3,196	46,400	57,323	6,347	1,924	4,922	150,267
Nevada	2,022	1,582	187	1,454	1,454	1,854	—	8,000	5,257	824	—	1,918	24,552

Orange	27,656	31,853	36,133	43,049	65,234	77,832	98,901	101,191	119,540	121,717	37,274	21,437	781,817
Placer	20,669	18,797	3,358	34,201	46,533	19,607	32,700	39,170	9,679	7,518	3,808	17,793	253,833
Plumas	—	—	—	—	—	—	2,800	4,000	—	—	—	—	6,800
Riverside	35,440	36,834	40,830	59,528	53,491	46,493	127,054	29,491	56,138	67,467	48,720	39,482	640,968
Sacramento†	21,794	27,928	37,725	39,104	59,767	26,655	17,348	89,710	95,320	57,570	7,734	4,089	484,744
San Benito	15,656	8,489	4,116	5,589	9,301	5,516	65,348	25,863	30,039	22,283	16,484	18,150	226,834
San Bernardino	50,143	54,316	53,650	83,811	70,660	59,265	55,361	39,638	72,884	73,524	29,773	19,513	662,538
San Diego	28,706	25,056	20,160	11,567	45,794	36,590	24,591	35,016	30,975	27,717	13,608	10,538	310,318
San Francisco	—	—	—	—	—	—	—	—	—	—	—	—	—
San Joaquin†	28,646	33,191	11,687	23,682	116,830	100,904	37,205	95,783	130,860	174,790	49,850	16,294	819,722
San Luis Obispo	2,005	7,962	22,216	27,332	18,543	6,445	10,156	14,377	23,175	16,318	2,598	—	151,127
San Mateo	6,136	2,527	14,583	24,661	31,955	49,750	23,134	20,706	12,566	8,471	6,136	6,136	206,761
Santa Barbara	38,461	39,190	46,756	46,308	43,199	45,644	25,418	45,201	46,360	57,611	31,489	32,395	499,932
Santa Clara	40,857	35,033	22,989	31,072	76,574	90,882	175,873	148,809	175,624	115,788	56,497	51,573	1,021,571
Santa Cruz	26,977	19,348	20,134	18,022	46,643	56,165	19,720	27,546	43,797	39,907	13,434	27,764	359,457
Shasta	—	—	—	—	6,250	6,250	—	700	3,975	1,875	—	—	19,050
Sierra	—	—	—	—	—	—	3,572	4,285	—	—	—	—	7,857
Siskiyou	—	—	—	—	300	18,446	34,572	20,310	1,417	5,900	675	—	81,620
Solano†	8,839	8,833	1,833	19,327	29,077	26,846	52,090	54,674	31,953	8,683	26,856	22,553	291,564
Sonoma	27,664	31,018	9,353	17,596	37,778	49,607	46,716	135,840	184,522	49,566	10,440	22,181	622,281
Stanislaus	27,231	27,980	5,740	26,609	64,184	96,784	99,781	137,647	105,552	87,441	28,495	25,954	733,398
Sutter	14,070	18,306	9,828	20,562	94,257	28,369	18,354	115,552	102,333	19,291	19,468	18,235	478,625
Tehama	3,224	2,783	1,689	3,852	8,801	10,407	20,304	30,276	26,673	12,022	4,392	2,926	127,349
Trinity	—	—	—	—	—	—	—	—	—	—	—	—	—
Tulare	159,337	84,853	22,336	71,635	112,340	67,225	81,820	149,539	215,478	283,191	255,269	157,449	1,660,472
Tuolumne	—	—	—	—	—	—	—	70	350	610	—	—	1,030
Ventura	37,252	35,012	27,021	28,667	36,596	47,117	102,496	36,911	81,460	172,011	39,784	21,970	666,297
Yolo†	4,190	5,963	7,039	31,077	39,431	39,154	21,124	59,327	54,619	29,156	12,077	11,742	314,899
Yuba	5,126	5,944	2,460	2,444	20,374	5,429	9,642	38,189	17,469	3,830	7,676	5,954	124,537
Total	1,172,964	1,085,807	984,345	1,451,819	2,300,837	2,185,884	2,071,250	2,762,691	3,100,383	2,842,085	1,428,853	1,078,882	22,467,800

* Dashes indicate months of no or inconsequential seasonal labor requirements.

† Certain delta areas of these counties are included in "delta lands," shown as a separate division in this table.

‡ Includes portions of Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties.

Source of data: Compiled from field collection of data. The data for important agricultural areas were published in mimeograph form for individual counties.

Figure 1, made up from the data presented in table 3, gives a graphic view of the varying requirements by months.

Three Major Periods of Demand.—The data presented in table 3 and figure 1 indicate three major periods of demand for seasonal workers. The period November to April, inclusive, is one of relatively low demand; May to July, inclusive, is a period of intermediate demand; and

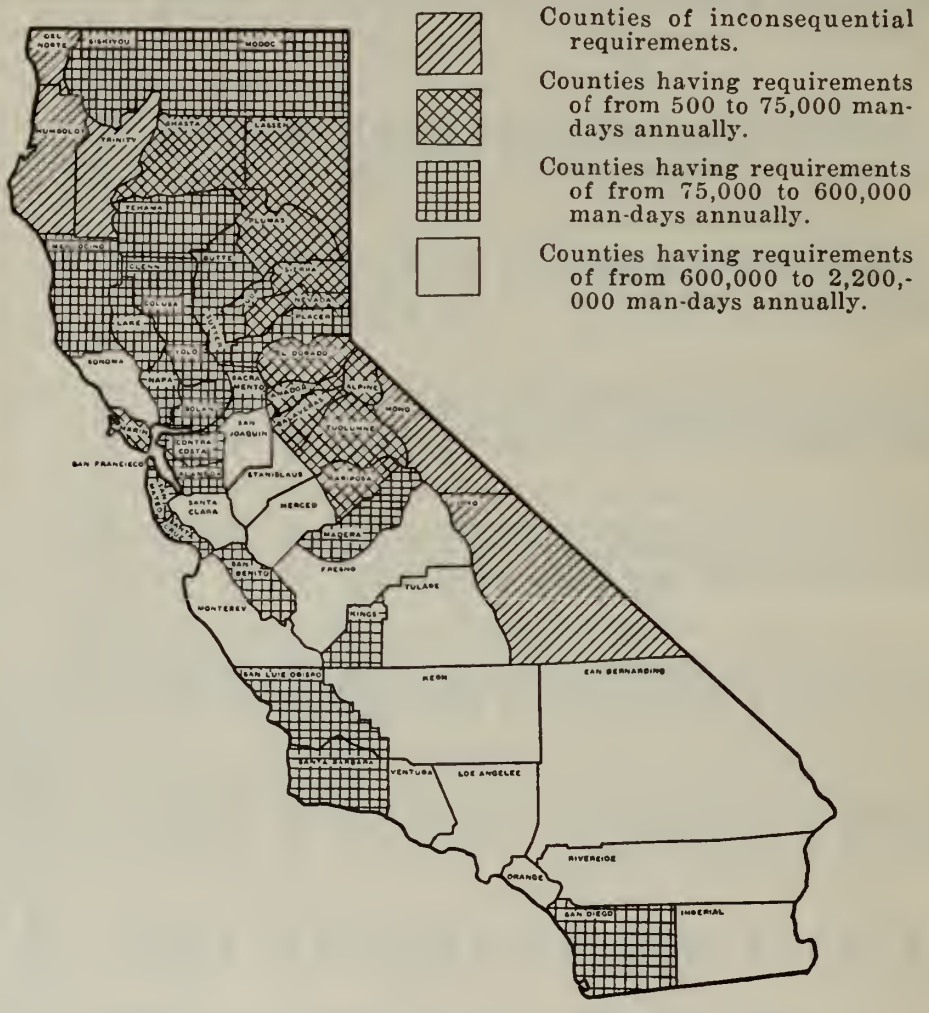

Fig. 2.—Annual requirements for seasonal labor, by counties. (Data from table 3.)

August to October, inclusive, is the period of maximum demand. Thus for six months the demand for seasonal labor is low, ranging from about 1.0 million to about 1.5 million man-days. For three months the demand is intermediate, ranging from about 2.0 million to 2.3 million man-days. The peak is likewise for three months, ranging from nearly 2.8 million to 3.1 million man-days.

Expressed in percentages, and using the period November to April as a base, the intermediate period of May to July requires an average of 82 per cent more labor each month than the base, and the period August to October requires 142 per cent more labor, or nearly two and one-half times as much as is required during the base period. In other words, for

each 100 workers required in the low period, 182 are required for the intermediate period, and 242 for the period of high demand.

County Variations in Requirements.—Attention is called to the last column of table 3. The data there indicate a wide variation in requirements for seasonal workers by counties. Annual requirements of about 1,000 man-days or less were reported for Mariposa, Alpine, and Tuolumne counties, whereas those in excess of 1,000,000 man-days were reported for Fresno, Tulare, Los Angeles, and Santa Clara counties and for the delta lands of the Sacramento and San Joaquin valleys.

A visual impression of the geographical distribution of the requirements for hand laborers may be obtained from figure 2. This map indicates areas of inconsequential requirements, some requirement, and substantial labor requirements.

SEASONAL LABOR REQUIREMENTS FOR SPECIFIC CROPS AND TASKS IN MAN-DAYS

A few of the many crops grown commercially in California have outstanding requirements for seasonal labor, especially for the performance of certain tasks. Examples are given in table 4 of the man-day requirements for carrots, cotton, hops, lettuce, lemons, oranges, onions, pears, peas (green), prunes, sugar beets, tomatoes, and walnuts. The data of table 4 show total acreage as reported for the various counties requiring use of seasonal labor, production from that acreage, man-days required for specified tasks, monthly requirements expressed as a percentage of the total annual requirements, and the computed labor requirement per 1,000 acres to serve as a basis for future estimates.

Seasonal Labor Requirements of Carrots.—The seasonal labor requirements for carrots include weeding, hoeing, pulling, and bunching. The total acreage reported as using this labor was 18,421 with a production of 4,811,750 crates of 6 dozen bunches. For this acreage and production there is a total annual requirement of 407,422 man-days of work, distributed fairly uniformly throughout the year. The period of greatest demand occurs during April to June, inclusive, and is occasioned largely by the harvest of the main spring crop and usually the greater need at this season of the year for hoeing and weeding the late-planted crops. The requirements during the 8 months of November to June, inclusive, are 80.5 per cent of the total annual labor requirement, those for the remaining 4 months are only about 19.5 per cent of the total.

Seasonal Labor Requirements of Cotton.—In cotton production seasonal labor is employed for chopping, hoeing, irrigating, and picking. The total acreage reported as using such labor was 216,212 with a production of 236,855 bales of cotton of about 500 pounds gross weight. For

TABLE 4

SEASONAL LABOR REQUIREMENTS FOR SPECIFIED TASKS AND CROPS; SEASONAL DISTRIBUTION, TOTAL MAN-DAYS, AND MAN-DAYS PER 1,000 ACRES, 1935–36

Task	Monthly requirements expressed as a percentage of the total annual requirement												Seasonal labor requirement in man-days (9 hours)	
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Per 1,000 acres
Carrots: based on 18,421 acres; yield of 4,811,750 crates*														
Weeding	12	12	8	10	5	4	7	5	10	8	9	10	49,356	2,679
Hoeing	9	0	2	16	28	7	5	4	6	9	7	7	5,923	322
Pulling and bunching	10	7	7	12	17	12	5	4	3	6	8	9	352,143	19,116
Total	10.2	7.5	7.1	11.8	15.7	11.0	5.2	4.1	3.9	6.3	8.1	9.1	407,422	22,117
Cotton: based on 216,212 acres; yield of 236,855 bales†														
Chopping	0	0	0	15	57	23	5	0	0	0	0	0	96,213	445
Hoeing	0	0	0	0	0	46	47	6	1	0	0	0	16,789	78
Irrigating	0	0	0	0	0	23	30	30	17	0	0	0	78,174	362
Picking	9	7	1	0	0	0	0	‡	3	38	28	14	1,387,538	6,417
Total	7.9	6.2	0.9	0.9	3.5	3.0	2.3	1.5	3.5	33.4	24.6	12.3	1,578,714	7,302
Hops: based on 7,916 acres; yield of 54,855 bales§														
Pruning, stringing, and training	0	0	12	27	30	23	8	0	0	0	0	0	96,710	12,217
Picking	0	0	0	0	0	0	0	77	23	0	0	0	185,800	23,471
Drying	0	0	0	0	0	0	0	70	30	0	0	0	8,635	1,091
Baling	0	0	0	0	0	0	0	0	100	0	0	0	2,540	321
Total	0.0	0.0	3.9	8.9	9.9	7.6	2.6	50.8	16.3	0.0	0.0	0.0	293,685	37,100
Lettuce: based on 77,701 acres; yield of 10,638,767 crates														
Irrigating	0	4	11	11	9	12	13	12	14	13	1	0	20,740	267
Thinning	2	7	11	5	9	9	8	10	11	15	11	2	148,452	1,911
Hoeing	11	5	8	11	6	8	10	9	9	13	5	7	67,685	871
Cutting	6	12	6	8	12	7	7	11	8	8	10	5	376,654	4,847
Field packing	2	4	12	22	7	21	2	22	7	1	0	0	38,278	493¶
Total	5.2	9.4	7.8	8.5	10.3	8.5	7.4	11.2	8.9	9.9	8.8	4.1	651,809	8,389
Lemons: based on 43,819 acres; yield of 19,180,125 boxes; Oranges (navel varieties and Valencias combined): 266,634 acres; yield of 42,894,036 boxes														
Picking lemons	10	10	11	9	12	8	6	6	4	6	8	10	824.799	43‖
Picking oranges	7	7	8	9	9	8	10	8	8	9	10	7	1,208,338	28‖
Total	8.2	8.2	9.2	9.0	10.2	8.0	8.4	7.2	6.4	7.8	9.2	8.2	2,033,137	71‖

Onions: based on 9,062 acres; yield of 1,495,101 hundredweight

Pulling, topping, sorting, and sacking	0	0	‡	3	16	16	10	19	24	11	‡	0	78,372	1.05**

Pears: based on 53,797 acres; yield of 169,902 tons

Pruning	29	23	5	0	0	0	0	0	0	0	16	27	169,579	3,152
Blight control	0	0	5	4	32	32	27	0	0	0	0	0	18,987	353
Spraying	7	‡	9	19	30	19	2	0	4	0	0	10	33,671	626
Picking	0	0	0	0	0	0	21	59	18	2	0	0	202,435	3,765††
Total	12.1	9.2	2.9	1.7	3.8	2.9	11.4	28.1	8.9	1.0	6.4	11.6	424,672	7,896

Peas (green): based on 72,055 acres; yield of 5,829,188 hampers (30-pounds)

Hoeing and cultivating	4	14	22	5	3	0	0	45	3	0	0	4	35,044	486
Picking	8	9	8	14	21	9	3	3	4	7	7	7	641,817	8,918‡‡
Total	7.8	9.3	8.7	13.5	20.1	8.5	2.8	5.2	4.0	6.6	6.6	6.9	676,861	9,404

Prunes: based on 159,991 acres; yield of 232,103 tons

Pruning	21	20	6	0	0	0	0	0	0	7	21	25	192,069	1,200
Picking up fruit	0	0	0	0	0	0	‡	24	69	7	0	0	469,046	2,930§§
Total	6.1	5.8	1.7	0.0	0.0	0.0	0.0	17.0	49.0	7.0	6.1	7.3	661,115	4,130

Sugar beets: based on 116,707 acres; yield of 1,577,760 tons

Thinning	0	6	26	49	16	3	0	0	0	0	0	0	239,091	2,049
Hoeing	0	0	3	18	37	29	10	3	0	0	0	0	137,490	1,178
Pulling, topping, and loading	0	0	0	0	0	0	8	31	29	26	4	2	277,524	2,378
Total	0.0	2.2	10.1	21.7	13.6	7.2	5.5	13.8	12.3	11.0	1.7	0.9	654,105	5,605

Tomatoes: based on 77,817 acres; yield of 415,954 tons

Transplanting in beds	0	20	80	0	0	0	0	0	0	0	0	0	10,751	138
Transplanting to fields	2	6	2	33	54	2	‡	0	0	0	0	0	65,137	837
Replanting misses	0	0	0	7	80	13	0	0	0	0	0	0	10,186	131
Hoeing	0	0	0	2	34	42	21	‡	0	0	0	0	86,288	1,109
Dusting	0	0	0	0	11	29	41	10	9	0	0	0	4,876	63
Picking (both canning and market stock)	0	0	0	1	3	3	7	14	31	36	4	‡	578,113	7,436¶¶
Total	0.2	0.8	1.3	3.9	12.0	7.6	8.5	11.3	23.8	27.5	3.1	0.0	755,351	9,724

Walnuts: based on 116,212 acres; yield of 51,708 tons

Pruning	33	33	34	0	0	0	0	0	0	0	0	0	4,380	38
Knocking and picking	0	0	0	0	0	0	0	0	38	59	3	0	119,513	1,029‖‖
Total	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0	36.6	56.9	2.9	0.0	123,893	1,067

* Crate of 6 dozen bunches.
† Bales of 500 pounds.
‡ Less than 1 per cent.
§ Bales of 190 pounds.
¶ Per 137,000 crates (4 or 5 dozen), yield per 1,000 acres.
‖ Per 1,000 boxes.
** Per ton.
†† Per 3,160 tons, yield per 1,000 acres.
‡‡ Per 81,000 hampers, yield per 1,000 acres.
§§ Per 1,450 tons, yield per 1,000 acres.
¶¶ Per 5,350 tons, yield per 1,000 acres.
‖‖ Per 445 tons, yield per 1,000 acres.

Source of data: Compiled from field collection of data. The data for important agricultural areas were published in mimeograph form for individual counties.

this acreage and production, annual requirements totaling 1,578,714 man-days of labor is indicated, of which 1,387,538 man-days, or 87.9 per cent of the total, are for picking alone. The picking season in California extends generally from September through February with peak labor demands for this operation occurring in October and November.

Seasonal Labor Requirements of Hops.—The seasonal labor requirements for hops include pruning, stringing and training, picking, drying, and baling. The total acreage reported as using seasonal labor was 7,916 with a production of 54,855 bales of 190 pounds.[6] For this acreage and volume of production the total annual labor requirement for performing the several operations mentioned above amounts to 293,685 man-days, or 37,100 man-days for each 1,000 acres. Although substantial amounts of labor are used during the late spring and summer months, the picking, drying, and baling operations in August and September account for approximately 67 per cent of the total seasonal labor requirement. The peak, which normally occurs in August, is frequently accentuated in any one area by the general necessity for completing the picking operation within the space of two to three weeks.

Seasonal Labor Requirements of Lettuce.—The seasonal labor requirements in lettuce production include irrigating, thinning, hoeing, cutting, and field packing. The total acreage reported as using seasonal labor was 77,701 with a production of 10,638,767 crates. With this acreage and production a total of 651,809 man-days of labor are required to perform the specified operations. Table 4 shows that there exists a wide and fairly uniform distribution of labor by operations and in total by months during most of the year. This is due to the widespread distribution of lettuce production and the marked differences in climatic conditions in the various producing areas of the state. In any one area, pronounced peaks of labor demand, particularly for the thinning and harvesting operations, are usually encountered.

Seasonal Labor Requirements of Lemons and Oranges.—In the production of lemons and oranges seasonal laborers are employed primarily for picking. The total acreage of lemons reported as using seasonal labor was 43,819 with a production of 19,180,125 boxes; the acreage of oranges (navel varieties and Valencias combined) amounted to 266,634 and yielded a total of 42,894,036 boxes. The total annual labor requirement for picking these two citrus fruits was 2,033,137 man-days of which lemons required 824,799, or 43 man-days per 1,000 boxes, and oranges required 1,208,338, or 28 man-days per 1,000 boxes. By referring to

[6] Some growers reported bales at 200 pounds, but all were reduced to 190-pound average for purposes of comparison.

table 4, it may be noted that the requirements, by months, are fairly uniform and continuous throughout the year.

Seasonal Labor Requirements of Onions.—Seasonal labor is used in onion production for pulling, topping, sorting, and sacking. The total acreage reported as using seasonal labor was 9,062 with a production of 1,495,101 hundredweight. These operations, for the acreage and volume of production indicated, required a total of 78,372 man-days, which is at the rate of 1.05 man-days for each ton of onions harvested. The principal demand for this labor occurs during the 5-month period May to October; it is very small in the preceding and following months.

Seasonal Labor Requirements of Pears.—The seasonal labor requirements for pears include pruning, blight control, spraying, and picking. The total acreage reported as using seasonal labor was 53,797 with a production of 169,902 tons. For this acreage and volume of production, total annual requirements for seasonal labor of 424,672 man-days are indicated. Of this amount, nearly one-half (48.4 per cent) is required during the period of July to September, inclusive. A secondary peak period occurs during the winter months, December to February, during which time approximately 33 per cent of the annual requirements occurs. For the remainder of the year the requirements are relatively low.

Pear blight, always present and requiring annually a force of workers during the spring months to effect its control, occurs in highly virulent form during some years. In these years, the seasonal labor requirements for carrying on control measures are materially greater than the amount indicated in table 4.

Seasonal Labor Requirements of Peas (Green).—The seasonal labor requirements for peas picked green for market include hoeing, cultivating, and picking. The total acreage reported as using seasonal labor was 72,055 with a production of 5,829,188 hampers of 30 pounds each. The total annual labor requirement and the requirements per 1,000 acres and per 81,000 hampers (the approximate yield per 1,000 acres at the time of collecting the data) amounted to 676,861 man-days and 9,404 man-days, respectively. The peak labor requirement for these operations occurs during April and May and is occasioned primarily by the harvest of the main, or spring crop. The requirements for seasonal laborers are relatively small and fairly evenly distributed throughout the remaining months, except in July and September.

Seasonal Labor Requirements of Prunes.—The seasonal labor requirements for prunes include pruning and picking up fruit. The total acreage reported using seasonal labor was 159,991 with a production of 232,103 tons. Total requirements for such labor of 661,115 man-days

are indicated for this acreage and volume of production, approximately two-thirds of which are used during August and September for harvesting the crop. The time limits within which the pruning operation may be performed satisfactorily are not so restricted as for many other operations. This fact, combined with the differences in climatic conditions and prevailing practices in the various producing areas, makes possible the extension of this operation over a relatively long period and provides for a fairly constant demand for tree pruners from November through February.

Seasonal Labor Requirements of Sugar Beets.—The seasonal labor requirements for sugar beets include thinning, hoeing, pulling, topping, and loading. The total acreage reported as using seasonal labor was 116,707 with a production of 1,577,760 tons. The total of 654,105 man-days required to perform these operations is widely and unequally distributed by months throughout the year. Peak periods of demand occur during April and May, occasioned primarily by hoeing and thinning operations, and from August to October when harvesting is at its height. In comparison with most field crops, the annual seasonal labor requirements for this crop are relatively high, requiring approximately 5,600 man-days of labor for each 1,000 acres.

Seasonal Labor Requirements of Tomatoes.—The seasonal labor requirements for tomatoes include transplanting in beds, transplanting to field, replanting misses, hoeing, dusting, and picking of both canning and market stock. The total acreage reported as using seasonal labor was 77,817, with a production of 415,954 tons. For the operations, the acreage, and the volume of production shown, a total of 755,351 man-days occurring largely during the period May through October is required. More than 50 per cent of the annual requirements, however, occurs normally during the months of September and October, when harvesting operations are at their peak.

Seasonal Labor Requirements of Walnuts.—Seasonal labor is required in walnut production for pruning, knocking, and picking up the nuts. The total acreage reported as using such labor was 116,212 with a production of 51,708 tons. A total of 123,893 man-days (table 4) is required primarily for the harvesting operations which are confined almost entirely to the months of September and October.

NUMBER OF INDIVIDUAL SEASONAL WORKERS REQUIRED

Data relating to seasonal labor requirements in connection with the production and preparation for market of various California crops have thus far been presented in terms of man-days. This is a fairly definite and reasonably accurate means of indicating labor requirements and

will suffice for some purposes to which these data may be put; but for others it is conceivable that there will be need for knowing, approximately, the number of individual workers required. An attempt has been made, therefore, to give some idea of seasonal labor requirements in terms of number of workers.

Factors Involved in Converting from Man-Days to Number of Workers.—Although actual determination of the number of seasonal workers required each month to perform the hand tasks in producing California crops cannot be made from the present available data, estimates of the numbers involved were compiled. The following factors were used as a basis for converting the data of man-days into numbers of workers: (1) days available for different tasks; (2) the time limits within which certain tasks must be performed for effective results; (3) distances between jobs of a similar nature; (4) the mobility of labor groups; and (5) the versatility of individual workers in performing various related and nonrelated tasks. Some quantitative measures, though inadequate, were available for the first three factors, but nothing tangible was at hand for the last two and therefore qualitative judgments had to be applied.

The number of days available for a given task requiring use of seasonal labor is determined by (*a*) the nature of the work and (*b*) weather conditions. A few tasks permit considerable latitude, such as pruning orchard trees, hoeing weeds, cultivating, and planting small grains. Most crops, however, have rather specific time limits within which the work should be completed if satisfactory performance is sought. Thus, spraying orchard trees, planting field and truck crops, thinning cotton and sugar beets, thinning peaches, picking various fruits, cutting alfalfa for hay, and numerous other tasks connected with the production of crops are best performed within rather narrow time limits. Weather conditions may limit the number of days when work can be performed, particularly during the rainy season when storms or wet conditions interfere with work programs.

On the basis of a 26 workday month, the number of days available for field work, compiled as a simple average from the county records of the state, is as follows:

Month	Available days	Month	Available days
January	19	August	26
February	21	September	26
March	22	October	24
April	23	November	23
May	24	December	19
June	25		
July	26	Total	278

TABLE 5

NUMBERS OF SEASONAL WORKERS REQUIRED FOR CALIFORNIA CROPS BY COUNTIES, MONTHS, AND STATE TOTALS, 1935–36

County	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Alameda	335	165	1,045	2,825	2,155	1,385	1,700	1,650	1,040	1,280	575	695
Alpine	—*	—	—	—	—	15	15	15	—	—	—	—
Amador	—	—	—	—	—	—	—	5	125	20	—	—
Butte	560	500	215	290	905	335	435	2,410	3,645	4,395	1,425	500
Calaveras	—	—	—	—	—	10	—	60	50	70	25	—
Colusa	180	150	75	375	300	1,200	450	1,375	1,700	500	160	120
Contra Costa†	750	400	180	1,050	2,000	1,600	2,350	1,900	1,650	2,700	900	1,000
Delta lands‡	1,700	500	7,565	12,500	12,300	11,285	5,600	5,600	4,150	3,800	2,800	3,400
El Dorado	360	325	65	60	340	250	190	300	400	15	150	270
Fresno	7,775	6,825	3,865	3,540	6,325	5,925	5,800	20,545	22,670	14,260	5,200	5,515
Glenn	325	310	150	135	390	790	580	635	850	2,285	490	320
Imperial	2,400	3,160	4,652	3,900	4,600	4,665	2,375	380	430	2,840	2,870	3,115
Kern	2,125	1,420	355	1,175	1,665	2,385	2,000	4,110	3,140	8,040	5,255	3,000
Kings	1,160	705	75	360	1,180	3,115	3,280	2,215	1,025	4,365	1,875	1,020
Lake	350	265	130	40	285	285	485	730	1,305	595	170	340
Lassen	—	—	—	—	—	600	750	300	30	30	—	—
Los Angeles	3,831	3,370	3,200	4,985	6,910	7,175	5,605	4,785	6,910	5,250	2,500	2,300
Madera	1,750	1,000	375	250	440	1,140	880	1,335	1,780	3,355	2,375	1,740
Marin	10	10	15	30	245	165	100	105	90	60	10	15
Mariposa	—	—	—	—	—	—	—	—	10	25	10	—
Mendocino	525	300	120	280	400	650	325	1,340	1,135	400	360	300
Merced	1,565	1,025	1,175	580	2,165	2,540	2,175	4,650	7,485	4,760	1,780	1,160
Modoc	—	—	—	—	10	700	1,300	1,500	40	150	20	—
Monterey	1,230	1,840	2,150	3,160	4,230	3,505	3,620	2,530	3,375	3,280	2,240	1,345
Napa	510	500	295	20	270	300	200	3,160	2,885	290	90	275
Nevada	130	90	20	120	90	85	400	—	420	50	—	100
Orange	1,460	1,340	1,675	1,725	2,570	2,975	4,400	4,395	4,955	4,225	1,555	975
Placer	1,300	1,120	285	3,000	3,525	1,100	1,300	1,550	525	375	350	1,000
Plumas	—	—	—	—	—	—	128	154	—	—	—	—
Riverside	1,635	1,660	2,526	2,745	2,380	1,850	4,785	1,231	1,810	2,385	1,945	1,605
Sacramento†	1,150	1,400	1,775	1,670	2,500	1,250	700	4,900	5,500	2,600	375	230
San Benito	900	425	200	250	450	250	2,700	1,300	1,300	1,200	800	950

San Bernardino	2,700	2,500	2,400	4,100	3,700	2,900	2,400	2,200	3,000	3,300	2,000	1,150
San Diego	1,450	1,200	950	550	2,000	1,725	1,050	1,650	1,400	1,200	650	850
San Joaquin†	1,600	1,875	600	1,520	5,900	6,300	1,900	3,950	6,850	8,000	2,500	860
San Luis Obispo	120	350	1,050	1,200	800	300	500	600	950	950	300	—
San Mateo	345	115	700	1,100	1,300	2,025	910	800	515	380	260	310
Santa Barbara	2,075	1,520	2,310	2,200	1,910	2,310	775	1,875	2,240	2,655	1,500	2,125
Santa Clara	2,303	2,000	1,950	3,035	3,375	4,730	6,960	6,700	7,200	6,430	2,600	3,200
Santa Cruz	1,690	1,010	1,060	820	3,300	2,625	810	1,585	1,840	1,860	1,025	1,560
Shasta	—	—	—	—	625	625	—	70	165	80	—	—
Sierra	—	—	—	—	—	—	165	165	—	—	—	—
Sisikiyou	—	—	—	—	15	730	1,335	785	100	245	35	—
Solano†	555	510	100	1,740	2,105	1,850	2,455	2,500	1,465	365	1,280	1,255
Sonoma	1,850	1,750	605	640	2,525	3,375	3,235	5,660	8,840	2,300	500	1,500
Stanislaus	1,450	1,400	300	1,800	3,025	6,300	5,200	5,600	4,900	3,610	1,670	1,300
Sutter	785	965	470	1,775	4,020	1,315	900	4,600	6,000	805	935	1,015
Tehama	190	175	100	335	400	1,025	1,675	1,650	1,200	650	275	190
Tulare	8,000	4,100	1,750	3,925	5,560	3,000	3,375	8,625	10,875	12,000	10,700	7,850
Tuolumne	—	—	—	—	—	—	—	10	25	35	—	—
Ventura	2,000	1,550	1,200	1,200	1,450	2,210	4,100	1,600	3,400	6,950	2,150	1,150
Yolo†	235	360	325	1,750	1,710	1,610	950	2,850	2,150	1,225	575	820
Yuba	285	315	120	280	890	325	405	1,690	1,175	190	350	335
Total	61,649	50,500	48,173	73,035	103,240	102,810	93,728	130,330	144,720	126,835	65,610	56,760

* Dashes indicate months of no or inconsequential seasonal labor requirements.

† Certain delta areas of these counties are included in "delta lands," shown as a separate division in this table.

‡ Includes portions of Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties.

Source of data: Compiled from field collection of data. The data for important agricultural areas were published in mimeographed form for individual counties.

These figures indicate the usual total number of days available each month for performing field operations in general, but must be reduced for many individual tasks performed on behalf of specific crops.

The principal centers of production of many of the crops requiring the use of seasonal labor are in widely separated geographic areas. Citrus-fruit production, for example, is concentrated mainly in the southern coastal plain and interior valleys, but there are also substantial acreages 200 miles north in Tulare and Fresno counties and lesser acreages in the northern Sacramento Valley. Concentrations of plantings of apricots, peaches, and other deciduous fruits occur in selected areas of the interior valleys from Tehama County in the north to San Bernardino County in the south, over a distance of more than 500 miles. Some of the field crops are also grown over a widespread area of the state, but others with narrower ranges of adaptation such, for example, as cotton, hops, and rice, are confined largely to more or less well-defined and frequently widely separated areas. Because the distances between plantings of similar crops and between tasks of a similar nature are frequently great, workers are often unable to move from one area to another in order to keep employed. The expense of moving these distances is sometimes too costly, and hence the mobility of the labor group is affected.

Most farm workers are either trained or interested in farm work of a somewhat limited nature, and therefore the ability or desire to engage in a multiplicity of tasks is lacking. In other words, versatility may be low. Thus, cotton choppers and pickers may be available only for those tasks with perhaps a limited usefulness in connection with other field crops having similar tasks. Workers who thin and harvest sugar beets do not usually perform tasks in connection with the harvesting of hay and grain. Professional fruit pickers tend to restrict their activities to tasks centering in the orchards of the state.

Total Needs by Counties and Months.—The numbers of seasonal workers by counties and months are presented in table 5. The figures reported in this table, as already pointed out, are based largely upon personal judgment. They may be considered, however, as approximations of minimum requirements for the acreages and yields of crops upon which the basic data were prefaced. Substitution of labor less efficient than the average would materially add to the numbers indicated in table 5. Moreover, changing conditions from year to year affecting acreages and yields of crops, shifts in location of crops, and seasonal variation in climatic conditions with attendant differences in cultural practices, in pest-control measures, and in harvesting periods would contribute to marked differences in labor requirements by months and in total for the year over

those reported. All things considered, for equal acreages and yields, there is little likelihood that fewer numbers of workers would be required and it is entirely probable that a minimum of 15 to 20 per cent more than the numbers indicated in table 5 would be needed, particularly during years when certain harvest periods overlap more than during the year 1935–36 when the basic data were collected.

In order to visualize better the requirements of agriculture for sea-

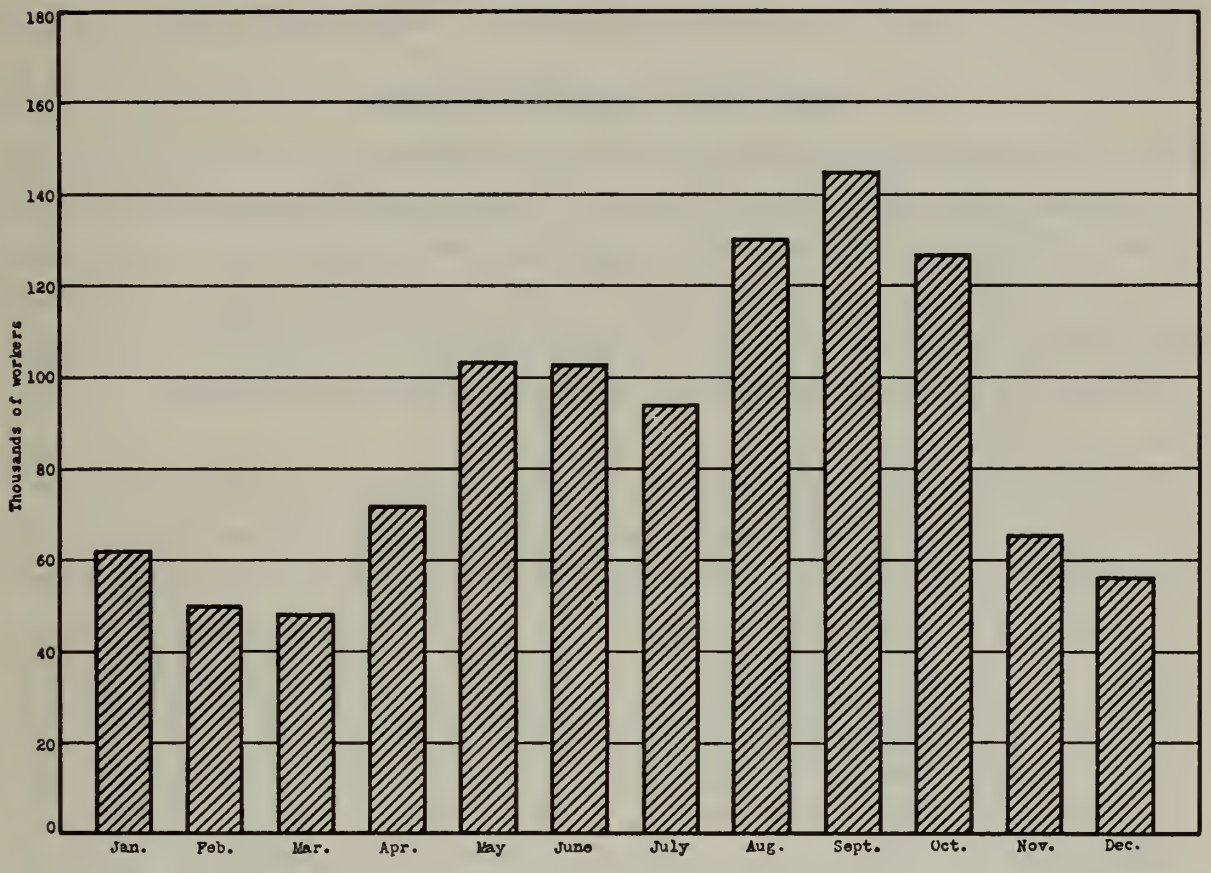

Fig. 3.—Estimated number of seasonal workers required each month for California crops. (Data from table 5.)

sonal labor, the total number of workers required each month, as reported in table 5, is presented in graphic form in figure 3.

Table 5 and figure 3 reveal marked variations from month to month in the absolute and relative requirements for seasonal workers both by counties and for the state. Totals for the state by months, however, indicate the same division of the year into three major periods of low, intermediate, and high demands for seasonal labor as was evident in the data expressed in man-days (see p. 14). From November through April, the period of low demand, the requirements by months are estimated to range from the equivalent of 48,000 to 72,000 workers of average ability. For the period of intermediate demand, May through July, they range from 94,000 to 103,000 workers each month. And for the period of great-

est demand, August through October, they range from 127,000 to 145,000 workers each month. Thus, the estimated requirements by months for the state range from an equivalent of 48,000 workers of average efficiency in March to 145,000 workers in September.

In estimating seasonal labor requirements of other years, all changes affecting them should be taken into account; estimates may then be made of the requirements for labor under the conditions prevailing at that time, by proper use of the data presented in this paper and in the individual county reports comprising the basis of this presentation.

SUMMARY AND DISCUSSION

The evidence resulting from the collection of field data and its subsequent compilation and analysis indicates total requirements of 22,467,800 man-days in 1935–36. The monthly requirements varied: from November through April, they ranged from 948,345 to 1,451,819 man-days; from May through July, they ranged from 2,071,250 to 2,300,837 man-days; from August through September, they ranged from 2,762,691 to 3,100,-383 man-days.

Seasonal labor requirements for specific crops are variable. They are least for field crops and greatest for fruit and truck crops. For crops of high seasonal labor demand the man-day requirements were found to be:

Crop	Man-day requirements (9-hour day)	Crop	Man-day requirements (9-hour day)
Carrots	22,117 per 1,000 acres	Pears	7,896 per 1,000 acres
Cotton	7,302 per 1,000 acres	Peas (green)	9,404 per 1,000 acres
Hops	37,100 per 1,000 acres	Prunes	4,130 per 1,000 acres
Lettuce	8,389 per 1,000 acres	Sugar beets	5,605 per 1,000 acres
Lemons and oranges	71 per 1,000 boxes	Tomatoes	9,724 per 1,000 acres
Onions	105 per ton	Walnuts	1,067 per 1,000 acres

The requirements for seasonal workers throughout the state, when the total man-days were converted into number of workers, varied from a relatively low figure of 48,173 in March to a high figure of 144,720 in September.

The data, however, are also presented in a way that will permit adjustments for predicting or determining seasonal labor requirements in terms of both man-days and minimum number of workers in future years, as long as technical operations and farming practices remain essentially as at present. These adjustments require taking into account changes in acreages of crops, in yields, in harvesting periods (because of climatic conditions), and in efficiency of workers as these may differ from the conditions prevailing at the time of collecting the basic data.

The combination of available days, differences in nature of tasks, fluctuating demands, lack of versatility on the part of workers, and distances between similar tasks, makes the conclusion obvious that the number of workers required during the peak period of August through October, cannot be provided with year-round work on California farms. Yet, if seasonal workers are not available to agriculture as and when required, California farmers cannot continue the production of many of the specialty crops at current volumes. In this event, both individuals and communities would be faced with the problem of effecting drastic and far-reaching reorganization of not only individual farms but also the entire agricultural industry. Another problem also arises in that many seasonal workers who rely solely upon agriculture as a source of employment cannot obtain enough work to provide adequate yearly earnings. If emphasis continues to be placed upon specialized farming, it means that agriculture must be subsidized by maintaining workers outside of agriculture at times when farm employment is at low levels so that an adequate farm supply will be available for the few months of maximum requirements.

There is no hope, at present, that merely raising wages will solve this problem because there is a limit to the amount that farmers can pay—a limit that falls short of insuring adequate yearly earnings to those workers who must be employed upon a seasonal basis. Raising wages to the fullest extent possible deserves every consideration, but the fluctuating seasonal requirements for workers is so great that under existing conditions increases in wages sufficient to protect the worker without placing an impossible load upon agriculture do not appear to be promising.

The primary purpose of this publication is to indicate demand for seasonal workers. The various findings are in effect an inventory of the demand aspect of seasonal labor. Eventually the data should be supplemented with a similar inventory of the supply side, data that shall show numbers of available workers segregated according to qualifications to perform specified tasks and by localities to which the labor of these workers is available.

To suggest specific remedies in detail is beyond the scope of this paper. More data are needed, particularly on the available numbers of qualified workers classified according to tasks and localities. There is need for more information concerning the part that industries other than agriculture can play or may be called upon to play in taking up the slack in agricultural employment. There is need to investigate what the state may and should do to provide employment during the slack seasons in agriculture. There is need for constructive thought and action designed

to evolve a program that will eventually tend in the direction of lessening peak labor loads, and in making more continuous work available to efficient workers. Seasonal workers require greater opportunity to market their services over longer periods in order to increase their yearly incomes. The problem is admittedly one of magnitude and calls for solutions that are possible, practical, and humane.

ACKNOWLEDGMENTS

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